

DETAILED ACTION

1. The drawings were received on 12/17/2009. These drawings are approved.
2. The withdrawn claims 7-10 and 18-21 are rejoined and allowed.

Reasons for Allowance

3. The following is an examiner's statement of reasons for allowance: the prior art does not teach the prior art does not teach a shape memory alloy (SMA) module with two shape memory coils connected mutually in series in the axial direction, a drive member and a fixing member on a common substrate, with a magnetic latch to hold the drive member and a drive circuit to provide an electric current to the SMA coils, where the latch is a magnetic plate with a penetration hole through which the drive member penetrates without contact, with the drive member having a plurality of magnetic bodies arranged mutually separated in the axial direction of the drive member and the magnetic plate is magnetized in the axial direction by the drive member, where the SMA coils are selectively heated by electrically driving the drive circuit, where the drive member moves in the axial direction by compressing or extending the heated SMA coils and is fixed and held in the axial direction by the magnetic latch of claim 1.

The prior art does not teach the prior art does not teach a shape memory alloy (SMA) module with two shape memory coils connected mutually in series in the axial direction, a drive member and a fixing member on a common substrate and a magnetic latch to hold the drive member with first and second SMA coils sequentially connected in series with a natural length part, its extended part, or compressed part of the first SMA coil, the extended part, or compressed part, and its natural length part of the

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second SMA coil in turn, the series-connected part of one end of the natural length part and one end of the extended or compressed part of each of said first and second SMA coils is connected to the drive member via the fixing member arranged in an aperture part provided to the substrate, and the first and second SMA coils, said drive member, and said fixing member are movably held about in parallel to said substrate without contact to the substrate, the other end of the natural length part of the first SMA coil and the other end of the natural length part of the second SMA coil are respectively connected to a ground electrode pattern provided to said substrate, the other end of the SMA coils are connected to a common electrode wiring pattern provided to the substrate, with a drive circuit to selectively current drives SMA coils, with the drive member moving in the axial direction by extending and compressing the heated SMA coils, and with the magnetic latch fixing the drive member at multiple steps in the axial direction of claims 4, 7 and 9.

The prior art does not teach a drive mechanism with a magnetic drive member connected to first and second SMA coils connected in series in the axial direction and a drive circuit to apply a correction to the SMA coils, and a magnetic latch, where the magnetic latch has a plurality of concave parts mutually arranged separately in the axis direction, and with the concave part region magnetized, such that the when SMA coils are selectively current-driven and heated by the drive circuit the drive member is moved along a plurality of concave parts of the latch part by compressing or extending the heated SMA coils, and the drive member is magnetically fixed to the magnetic latch part held, of claim 11, 18 and 21.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl I.E. Tamai whose telephone number is (571) 272 - 2036.

The examiner can be normally contacted on Monday through Friday from 8:00 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mrs. Quyen Leung, can be reached at (571) 272 - 8188. The facsimile number for the Group is (571) 273 - 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Karl I Tamai/
PRIMARY PATENT EXAMINER
January 14, 2010